



Africa-EU collaboration on Food and Nutrition Security and Sustainable Agriculture: The IntensAfrica Initiative



Sustainable Intensification controversies and research issues:

An approach through contrasted pathways

by P Petithuguenin (Cirad)



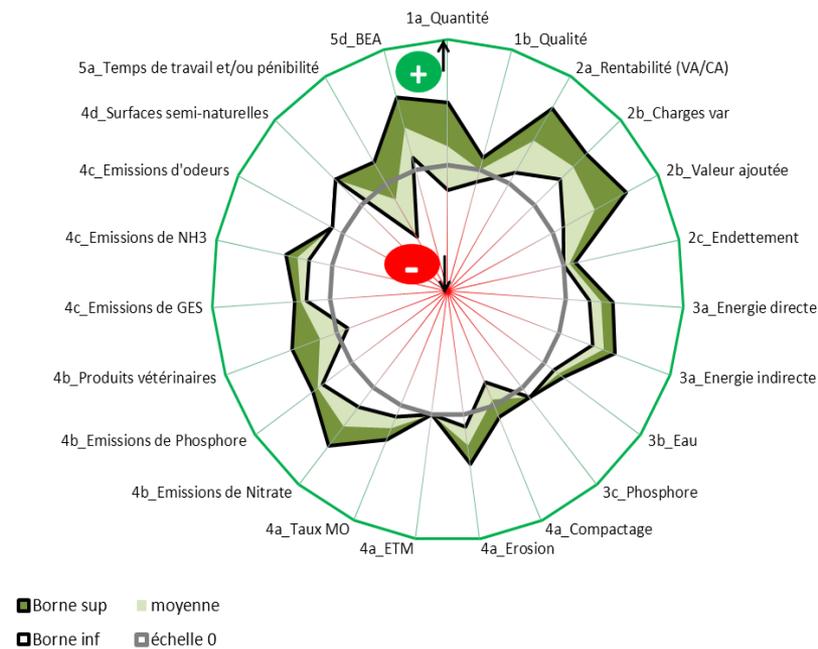
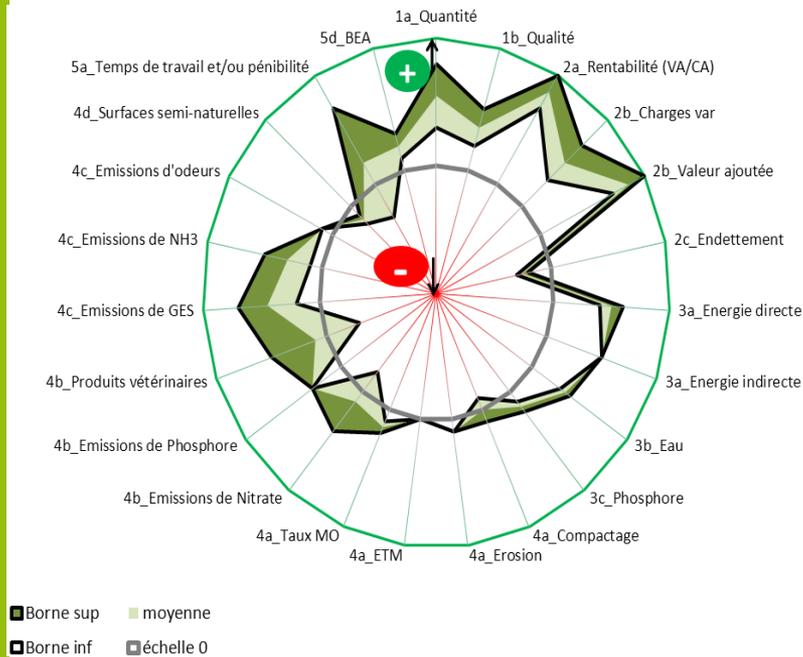
Sustainable Intensification

- In the “classical” view, the three traditional production factors are mobilized to explain agricultural intensification: Land, Labour and Capital. Intensification relies on quantity of inputs per one of these factors, the inputs concerned being mainly fossil-energy-based obtained with capital investment.
- In “sustainable intensification”, other factors and assets are taken into consideration as new inputs to be used more intensively: knowledge; ecosystem services and ecological processes; human capital, work force, incomes and jobs; inequalities and territory planning...

Comparing the multi-criteria performances of two agricultural systems (an example)

- *low input cattle farm (meat production)*

- *Dairy Farm in lowlands*



Sustainable Intensification

- Definition of “Sustainable Intensification”: to produce more outputs (not limited to agricultural products) with a more efficient use of all inputs (not only improved seeds and fertilizers but also knowledge and know-how) on a durable basis, while building resilience and the social and natural capitals, reducing environmental damage and improving the flow of environmental services.

or to “*produce more and better with less*”

=> An excessively broad concept. Sustainability has trade-offs, and is therefore not only “technical” but very much a social/political choice !

Many controversies around intensification !

- Example in Europe regarding the use of GMOs, or regarding the production potential of organic agriculture (*“organic agriculture can / cannot feed the world”*)
- Example in Africa: the 7 commitments of the Malabo declaration endorsed by African head of states, in June 2014



Malabo Declaration

1. Recommitment to the Principles and Values of the CAADP Process
2. Recommitment to enhance investment finance in Agriculture
 - o Uphold 10% public spending target
 - o Operationalization of Africa Investment Bank
3. Commitment to Ending Hunger by 2025
 - o At least **double productivity (focusing on Inputs, irrigation, mechanization)**
 - o Reduce Post Harvest Losses at least by half
 - o **Nutrition**: reduce stunting to 10%
4. Commitment to Halving Poverty, by 2025, through **inclusive** Agricultural Growth and Transformation
 - o Sustain Annual sector growth in Agricultural GDP at least 6%
 - o Establish and/or strengthen inclusive public-private partnerships for at least five (5) priority agricultural commodity value chains with strong linkage to **smallholder** agriculture.
 - o Create **job** opportunities for at least 30% of the youth in agricultural **value chains**.
 - o Preferential entry & participation by women and youth in gainful and attractive **agribusiness**
5. Commitment to Boosting Intra-African Trade in Agricultural Commodities & Services
 - o Triple intra-Africa trade in agricultural commodities
 - o Fast track continental free trade area & transition to a continental Common External tariff scheme
6. Commitment to Enhancing **Resilience** in livelihoods & production systems to climate variability and other shocks
7. Commitment to Mutual Accountability to Actions and Results Through the CAADP Result Framework - conduct a biennial Agricultural Review Process



ProIntensAfrica methodological approach to build the R&I Agenda

- Considering a **wide spectrum of documented** intensification options and pathways for Africa
- Defining **contrasted pathways**
- Organizing a **participative approach** with a range of diversified stakeholders

- A methodology involving the **review of convergences, contradictions and controversies, gaps and trade-offs** is essential
- **Literature review...**
- and **Case studies** are critical in addressing the above issues.



Basis for a typology.

Natural dynamics

Natural ecosystem

Traditional farming systems with no input

Conventionally intensified farming systems

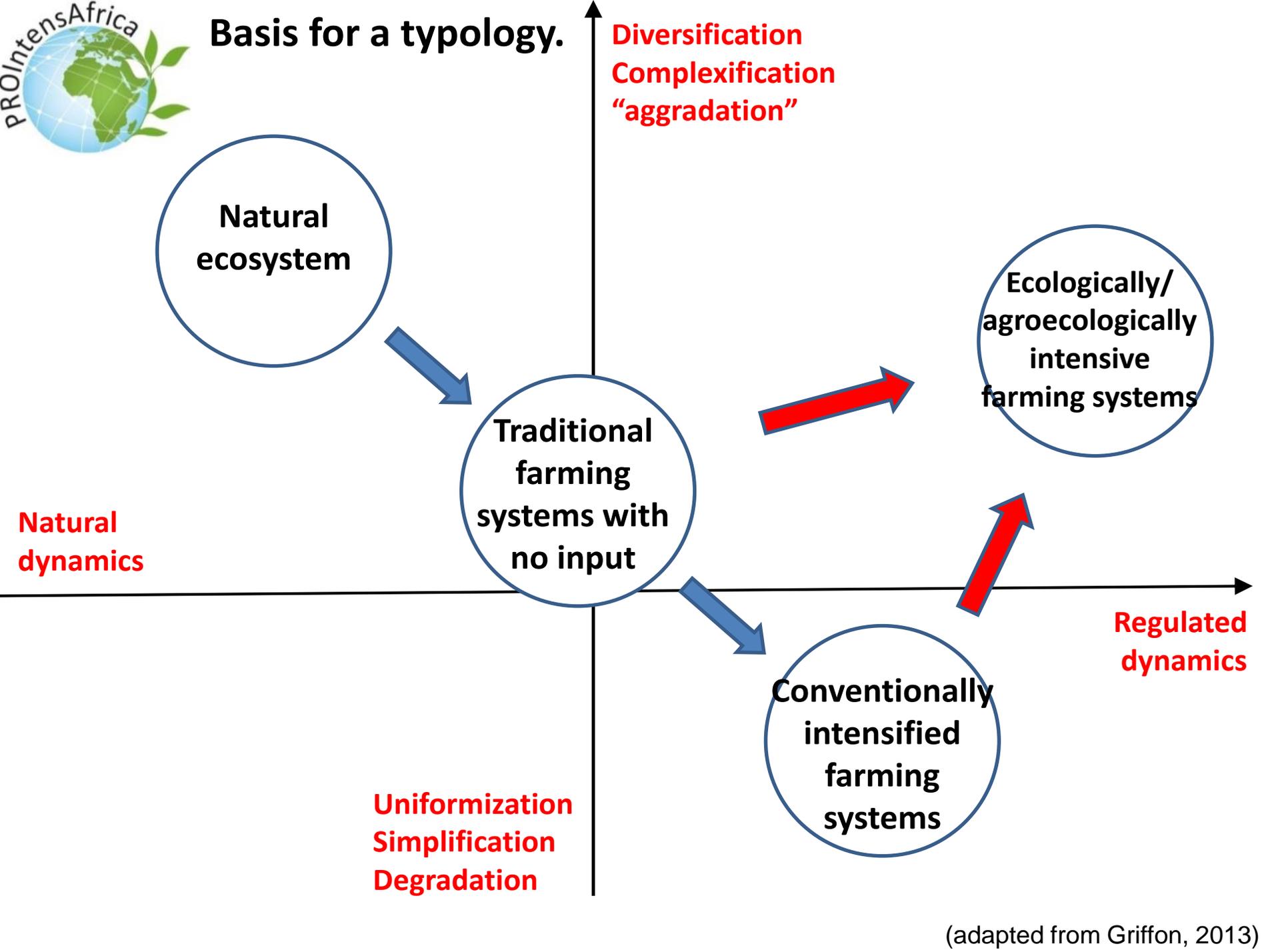
Ecologically/ agroecologically intensive farming systems

Diversification
Complexification
"aggradation"

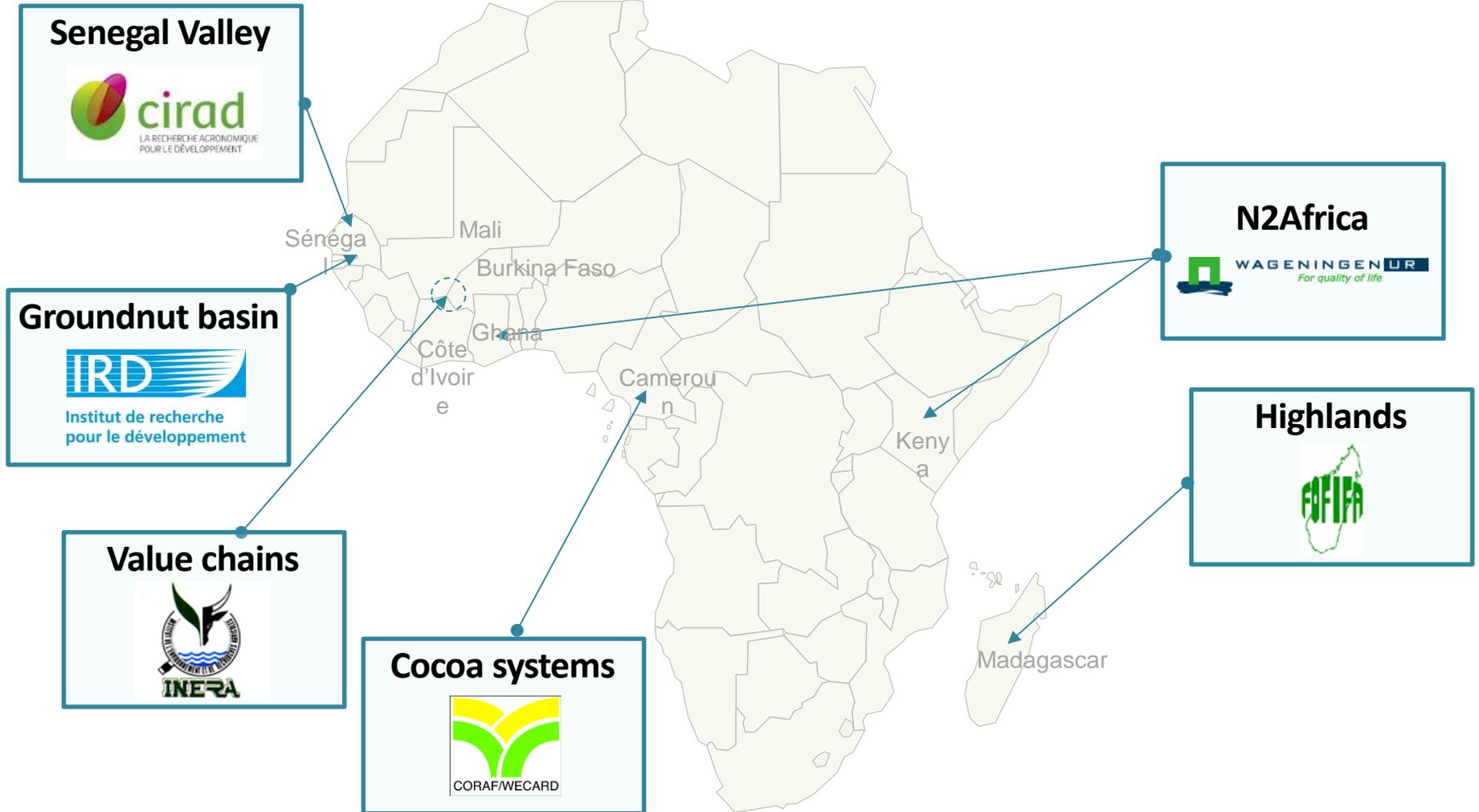
Uniformization
Simplification
Degradation

Regulated dynamics

(adapted from Griffon, 2013)



In Depth Cases Studies (IDCS)



Thinking Around Light Cases Studies (LCS)

7. FoodAfrica WP2 Senegal Dairy Genetics Food Africa
How do different animal and management types benefit households?

13. Agricultural intensification in Mali and Sudan through improved soil fertility management and mechanization

Improved planter as drivers for agricultural intensification in Mali and Sudan.

1. Community Led Potato Seed Production, Multiplication and Distribution in Potato Growing Areas of Eritrea

12. Nutrition Security as a driver of sustainable intensification

Zentrum für Entwicklungsforschung
Center for Development Research
University of Bonn

ZEF

Nutri|HAF

Diversifying agriculture for balanced nutrition through fruits and vegetables in multi-storey cropping systems

10. Consortium to Improve Agricultural-based Livelihoods in Central Africa

UCL
Université catholique de Louvain

15. Linking farmers to markets - intensification through certified organic production in Uganda
Market opportunities & civil society as drivers of intensification

14. Organic certification as commercial agro-development strategy in East Africa

AMULIS UNIVERSITY

3. Preservation and increase of soil organic carbon content farming activities used by smallholder farmers of Mt. Kenya region by

Szent István University

5. Sustainable Intensification Pathways for Maize-Legume Cropping Systems Mozambique and Tanzania

ARC • IAVR
INSTITUTO SUPERIOR D' AGRONOMIA
INSTITUTO SUPERIOR PORTUGUÊS DE AGRONOMIA
ISPA

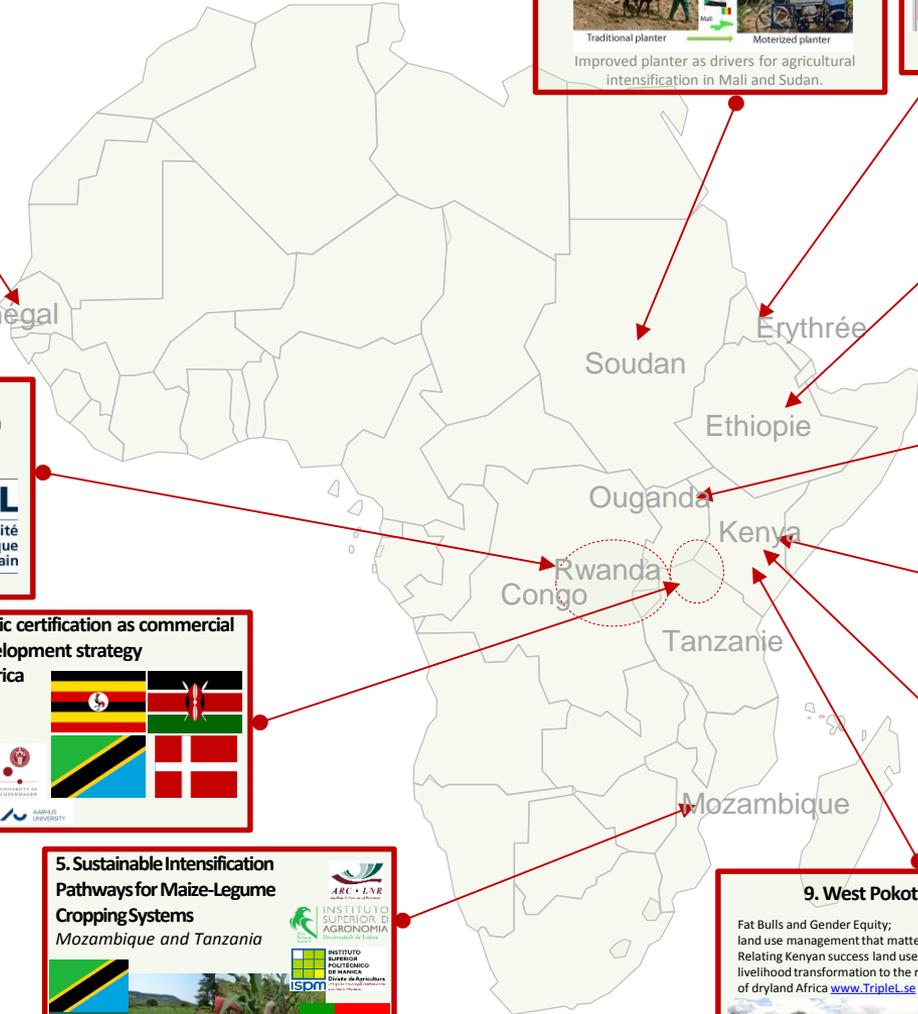
9. West Pokot County

Fat Bulls and Gender Equity; land use management that matters
Relating Kenyan success land use and livelihood transformation to the rest of dryland Africa www.TripleL.se

Kenya flag, Sweden flag

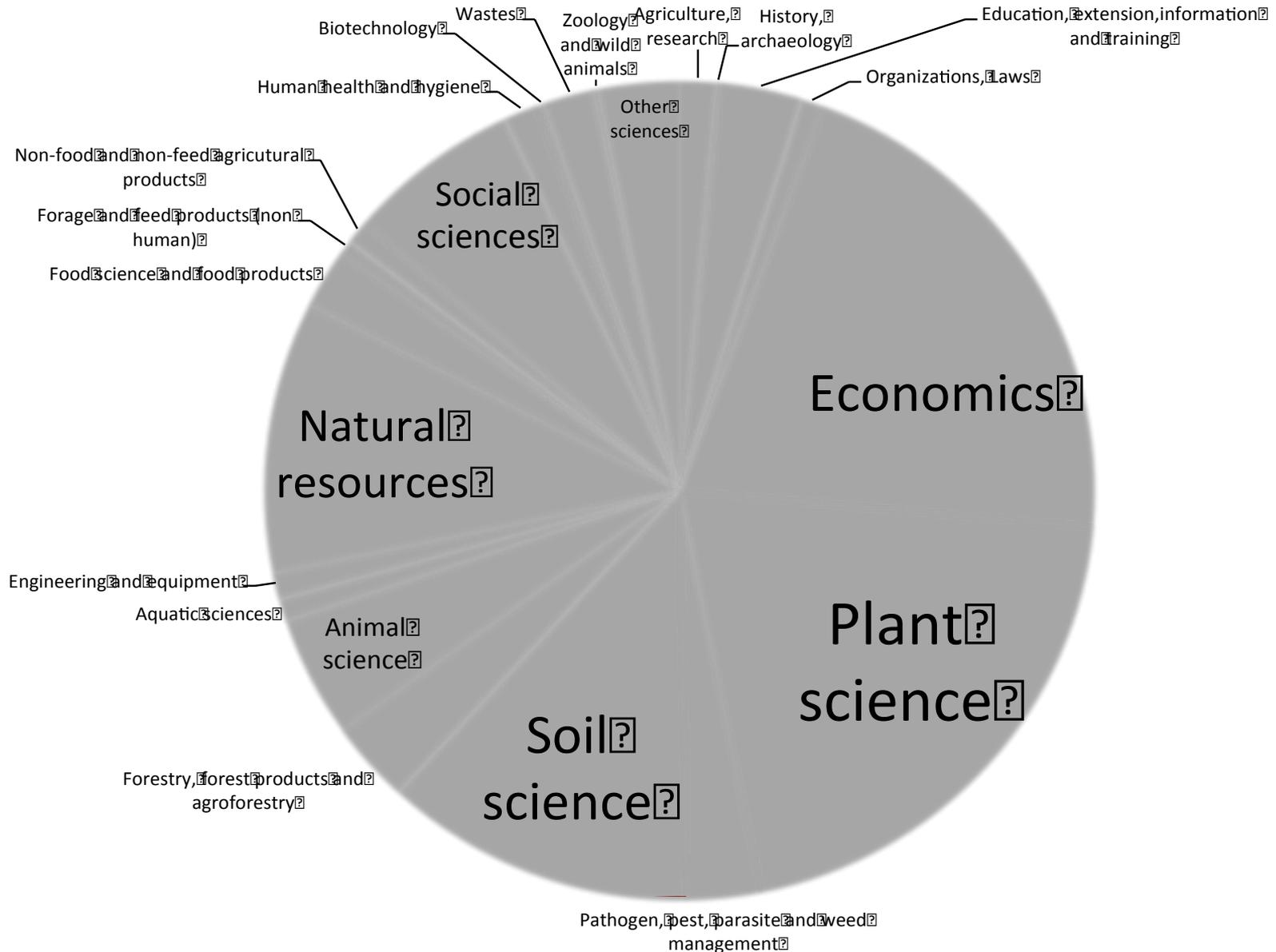
8. Sustainable intensification pathways for dairy in the Kenyan highlands
Dairy sector transitioning from smallholder mixed farming to more specialized dairy farming. Focus on supply chain integration, pluriform innovation system, and institutional governance

WAGENINGEN UR
UNIVERSITY OF GREECE



High-input intensification

n=3329



Proposed typology of I. pathways

Four contrasted pathways

A pathway = a given technical system
+ actors + policies

Five key aspects are defining the pathways: vision and values; organization of the food chain; dimensions addressed by the agricultural model; agricultural practices; and source of energy and materials.

Website: <http://www.intensafrica.org/>

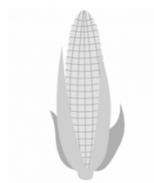


Four contrasted pathways (or ideotypes)



CONVENTIONAL
AGRICULTURE
PATHWAY

This pathway is dominated by high use of external inputs (such as improved varieties and breeds of crop and livestock, GMO, pesticides and mineral fertilizers) and extensive use of irrigation and mechanization. This pathway is a continuity of the green revolution and endears the use of high-tech provided that such will improve productivity. It dominantly refers to maximizing production as its goal in the short term.



ECOLOGICAL
AGRICULTURE
PATHWAY

This “ecological agriculture” pathway primarily seeks intensification through rational use of biotechnology, modest external inputs, irrigation and mechanization in such a way that the ecological cycles are maintained. It seeks to integrate new knowledge, indigenous knowledge and ecological services to ensure a sustainable intensive agriculture.



AGROECOLOGY
PATHWAY

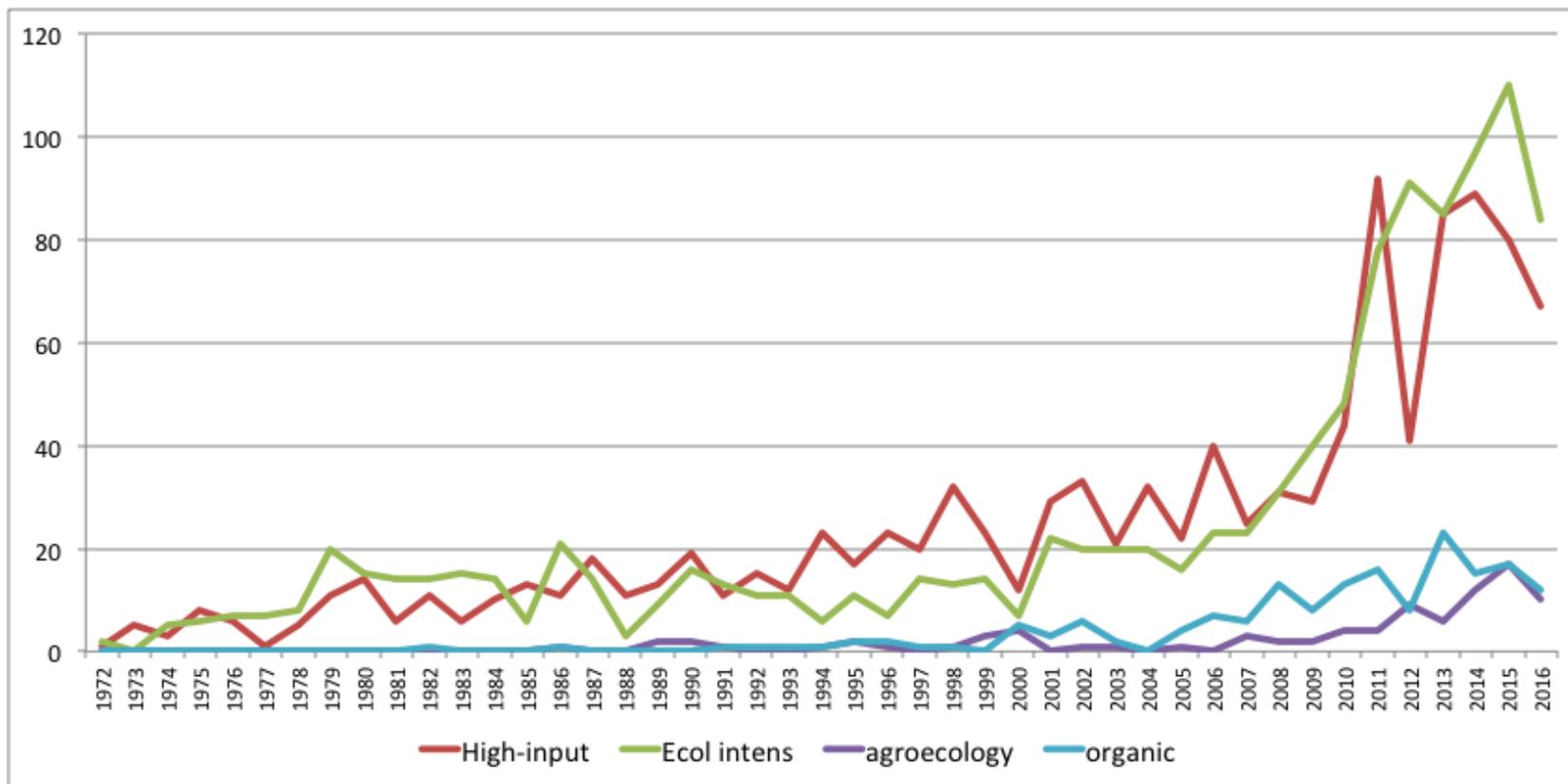
This “agroecology” pathway is based on a convergence of agronomy and ecology and on integration of technical and socio/political considerations. Maximization of productivity or production are not the main goals of this pathway, rather the optimization of outputs (economic, environmental, social). Intensification in this sense is subordinated to welfare development and autonomy of the production system and of the farm.



ORGANIC
AGRICULTURE
PATHWAY

The organic agriculture pathway refrains from the use of pesticides and mineral fertilizers and emulates ecological systems and cycles. Its main objective is not intensification but a shift to better quality and certification for better valorization.

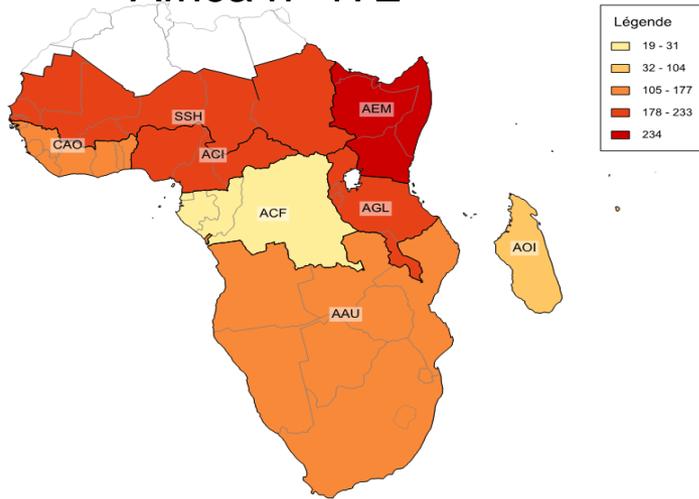
General trends: pathways 1 and 2 prevalence





input intensification n=1129

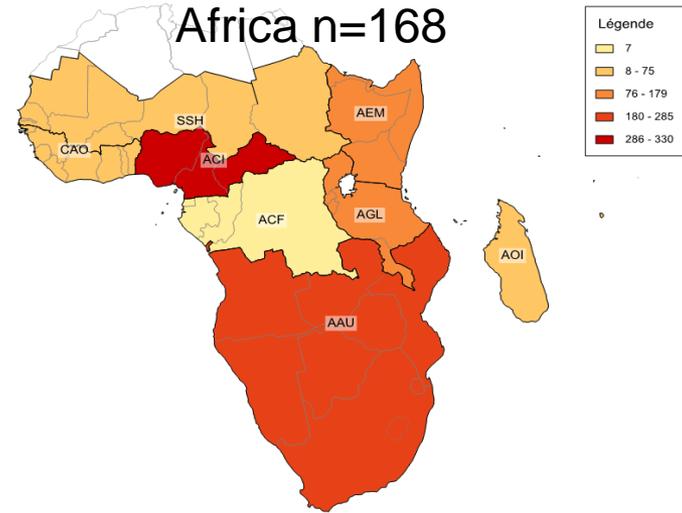
Africa n=172



Ecological intensification

n=1012

Africa n=168



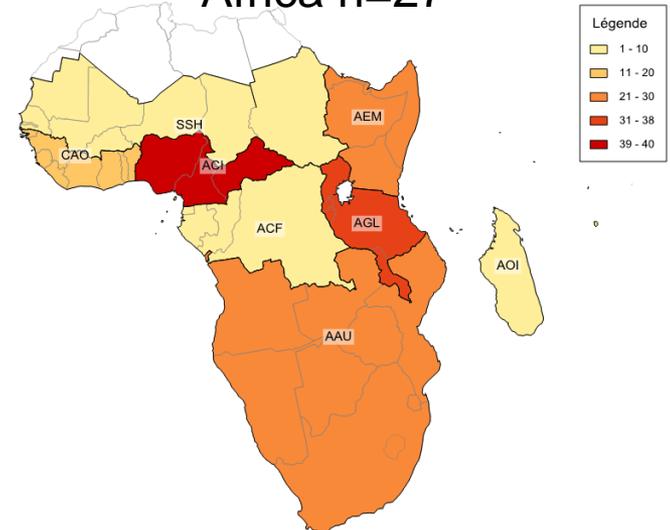
Agroecology n=95

Africa n=17



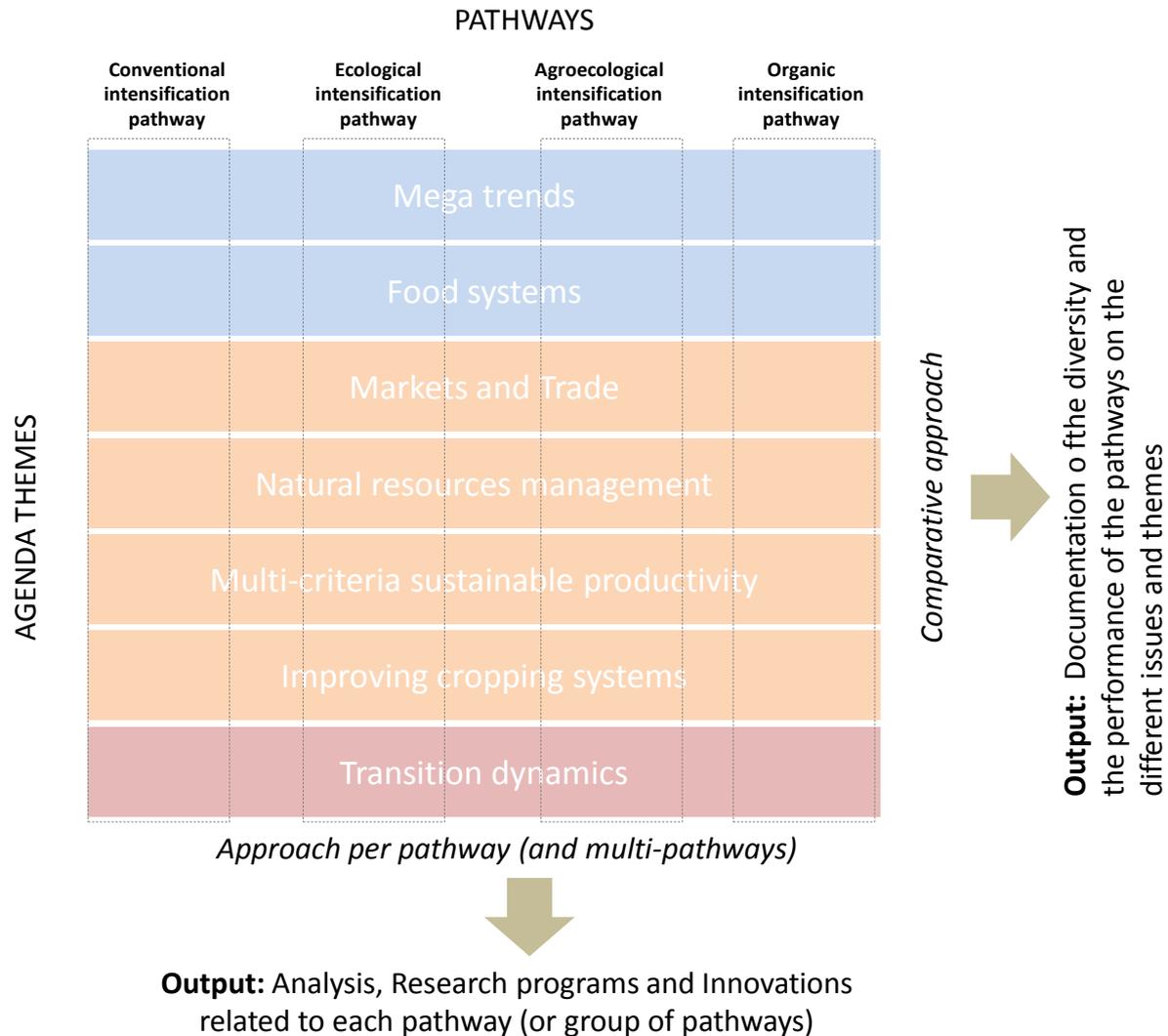
Organic agriculture n=159

Africa n=27





How the pathway approach can be used to establish a R&I Agenda





Some conclusions

- The classification around contrasted pathways is helpful to differentiate the paradigms and help the R&I stakeholders and public policies to position themselves or their initiatives.
- Many diverse pathways are advocated for, but none have proved to be fully convincing beyond the short term and/or beyond the local level, or fully able to face the challenges and unknowns of the more distant future.
- A variety of pathways is required, as there is no “one size fits all”. But diversity needs to be nurtured (path-dependencies and lock-ins are soon in place!)
- The role of R&I is to
 - broaden the range of options
 - and provide adequate information and tools for decision making, within options and between options.

Expectations about Sustainable Intensification can be overwhelming

